Boyle’s Law Lab

**Supplies:**

1 Syringe per group

3 Mini Marshmallows

**Purpose:** In this lab we will visually demonstrate the affects that pressure and volume have on each other to further understand Boyle’s Law

**Hypothesis:** What do you think will happen to the size of the marshmallows as we change the pressure levels in the syringe?

I think that…

**Procedure:**

1. Take off the plunger and place all 3 marshmallows in the syringe. Replace the plunger
2. Push the plunger down as far as it will go without touching the marshmallows
3. Place one finger on the end of the syringe and pull the plunger back
4. Observe the marshmallows, what happens? Why do you think this happens?
5. Record your observations below, include before and after drawings of the marshmallow
6. Place on finger on the end of the syringe and push the plunger as far down as possible without squashing the marshmallows
7. Observe the marshmallows, what happens? Why do you think this happens?
8. Record your observations below, include before and after drawings of the marshmallow

**Boyle’s Law Group Practice**

***Work together*** *in your groups to answer each of the following word problems in complete sentences when appropriate. Remember, Boyle’s Law states that pressure and volume have an inverse relationship with one another. Raise your hand quietly if you have any questions.*

1. As pressure increase, what happens to volume?
2. Draw and label a graph that demonstrates Boyle’s law.
3. In the final minutes of a soccer game, Christiano Ronaldo kicks the soccer ball with a great increase in pressure. What happens to the volume of air in the soccer ball as he applies the pressure from his foot to the ball?
4. At the buzzer, Nancy “Nothin But” Net shoots the basketball towards the basket. At the normal basketball pressure of 100 Pascals, the ball has a volume of 5 Liters. The ball slams into the backboard and falls through the net for 2 points. On impact with the backboard, what happens to the volume of air in the basketball? Does it increase or decrease?
5. Krusty the clown is blowing up balloons at Sophia’s 3rd birthday party. Krusty is rust in his balloon blowing skills and accidently releases 5 balloons in the air. What happens to the balloons as they are released into the atmosphere?
6. A gas occupies 12.3 liters at a pressure of 40.0 mm Hg. What is the volume when the pressure is increased to 60.0 mm Hg
7. If a gas at 25.0 °C occupies 3.60 liters at a pressure of 1.00 atm, what will be its volume at a pressure of 2.50 atm?
8. To what pressure must a gas be compressed in order to get into a 3.00 cubic foot tank the entire weight of a gas that occupies 400.0 cu. ft. at standard pressure?
9. A gas occupies 1.56 L at 1.00 atm. What will be the volume of this gas if the pressure becomes 3.00 atm?
10. A gas occupies 11.2 liters at 0.860 atm. What is the pressure if the volume becomes 15.0 L?
11. 500.0 mL of a gas is collected at 745.0 mm Hg. What will the volume be at standard pressure?